

possessing great lustre and strength, and pronounced superior to Japanese and all other silks, except the best Chinese, by competent judges.

The silk is unwound by a simple process perfected by Mr. Trouvelot, each cocoon yielding about 1500 yards. This insect is very hardy, being found throughout the Northern States and Canada, and, as it feeds upon the leaves of oak, maple, willow, and other common forest trees, may be reared easily in any part of the country.

Mr. Trouvelot has gradually increased his stock from year to year, by raising young from the eggs of the few individuals first captured, until he has at present seven waggon-loads of cocoons, the entire progeny of which he proposes to raise during the coming season.

The thanks of the country are due to the ingenious and persevering author of this successful attempt to introduce a new and interesting field for industry and enterprise, which cannot fail to be a source of profit to those who intelligently engage in it, and of increased wealth and prosperity to the people, should it be developed to the extent that now seems possible.

The first public notice of his experiments with this insect was given by Mr. Trouvelot at a meeting of the Institute of Technology, at Boston, about a year ago, when he exhibited specimens of silk manufactured from it, both natural-coloured and dyed.—*Silliman's Journal*, March 1865.

On Viviparous Fishes of the Genus Hemirhamphus.
By PROFESSOR PETERS.

Whilst most of the Sharks and Rays, with the exception only of the oviparous *Scyllia* and *Rajæ*, produce living young, the other Fishes are usually oviparous. Exceptions to this rule are comparatively rare: according to extant observations, there are only, among the Cataphracti, *Sebastes viviparus*, Kröyer (as observed by Kröyer); among the Blennii, *Zoarces viviparus*, Linn.; among the Cyprinodontes, the genera *Anableps* and *Pœcilia* (and *Molliensia*); and the whole of the Embiotocæ. Dr. Jagor, however, has made the interesting observation that certain species of the genus *Hemirhamphus* are likewise viviparous—a genus which belongs to the family of *Scomberesoces*, in the eggs of which Dr. Haeckel (Müller's Archiv, 1855, p. 23) has discovered a remarkable production of peculiar fibres between the yelk and the vitelline membrane. The species in which Dr. Jagor has discovered this mode of development are—

1. *Hemirhamphus fluviatilis*, Blkr. (*Dermogenys pusilla*, K. v. H.). “Sept. 1858, Java, island of Nusa Kumbangau, from a limestone cavity of the Beck Manundjaja; fish with embryos.”

2. *Hemirhamphus viviparus*, n. sp. Pinna caudali convexa; pinna dorsali anali brevior, radio primo post radium primum analem inserto; pinnis analibus post $\frac{9}{16}$ longitudinis totalis insertis; capite dorsoque subplanis; longitudine capitis $\frac{5}{16}$ longit. totalis æquali: flavescens, nigro irroratus, rostri apice, lineis tribus a nucha ad pinnam dorsalem extensis, membrana inter radium primum et secundum

analem, radii secundi et tertii dorsalis parte basali maculaque post-operculari nigris. Squamis lin. long. 45, transv. 12 vel 13. D. 10 vel 11; A. 14 vel 15. Longitudo tota 0·095 metri.

In the whole structure of the body this species is very similar to the preceding one, but it is considerably larger. The two species might probably be distinguished, by the rounded, and not bilobed, caudal fin, and the short dorsal fin, as a peculiar and readily recognizable subgenus, from the rest of the *Hemirhamphi*; for this the name *Dermatogenys* (*Dermogenys*), proposed by Kuhl and Van Hasselt, might then be retained.

Dr. Jagor took this last species upon the island of Samar, in the Basey River, "with living young and fully developed ova," as stated in the note appended to it, and as shown by the specimens.—*Monatsber. Akad. Wiss. zu Berlin*, March 1865, p. 132.

On the Production of the Sexes.

By M. COSTE.

In a former Number of the 'Annals' (ser. 3. vol. xiii. p. 68) a translation was given of a remarkable paper by M. Thury, of Geneva, upon a supposed law of the production of the sexes in cattle. M. Thury believes that the ovum changes its sex as it becomes more and more mature, being female at the commencement of the rutting-period, and male towards its conclusion: hence, by permitting animals to copulate only at the commencement or close of the rut, female or male offspring ought to be procured. This, M. Thury says, has been done in twenty-nine experiments made for the confirmation of his hypothesis; but M. Coste, whilst admitting the value of Thury's observations, as probably calling attention to the direction in which researches on this most interesting but difficult subject should be pursued, states that his own researches have led him to conclusions opposed to those of the Swiss physiologist.

M. Coste denies that the descent of the ovum takes place at the commencement of the rut, and that it is impregnated during this descent, as assumed by M. Thury. He says that during this period the ovum remains enclosed in its capsule, and that the rut ceases with the descent of the ovum into the matrix. When this takes place without fecundation, the ovum is abortive; and the fecundation takes place within the ovary, and whilst the ovum is still enclosed in its capsule. When female animals are opened two hours after copulation, the spermatozoids are found moving among the fringes of the vestibule and upon the surface of the ovary itself. Hence the question is, whether the two degrees of maturation assumed by M. Thury exist during the ovarian life of the ovum.

Now the most mature ovum must be that of which the dehiscence is imminent or has just taken place, and of which the germ, if not at once impregnated, would perish immediately. According to Thury, such an ovum should give a male product; one which has not attained to this limit of evolution should furnish a female product. To test this hypothesis, birds (in which a single copulation